

## INSTRUCTIONS FOR SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT DURING 1992

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### GENERAL INSTRUCTIONS

Comprehensive and timely information about the nature and support of corporate research and development activities is an important component in the overall assessment of our nation's scientific and technological resources. The information you provide is used to prepare national measures of industrial research and development not available from any other source. By carefully completing this report, the accuracy of this information is ensured.

**Estimates are Acceptable** – If you cannot answer a question from your company records, please estimate the answer carefully. Direct any questions regarding this form to the Bureau of the Census, ATTN: Industry Division, Washington, DC 20233-0001 or call (301) 763-5598.

**Additional Forms** – Photocopies of this form are acceptable. If you require additional forms, write to the Bureau of the Census, 1201 East 10th Street, Jeffersonville, IN 47132-0001 or call (812) 298-3331.

**Companies Reporting in Survey for the First Time** – Companies which did not report in the 1991 survey are asked to provide figures for both 1991 and 1992. If the company had no R&D expenditures, complete only Item 1. Enter "No R&D" in the "Remarks" section, sign, and return the form.

**Figures for Earlier Years are Preposted on the Form** – If your company reported for 1991, entries from that form have been copied on the present form. **Please describe in the "Remarks" section (page 2 of the form) the reasons for any substantial**

**increase or decrease in the 1992 figures entered on this form when compared to corresponding 1991 figures.** Examples of such reasons are new government contracts, acquisitions and divestitures, revised accounting method, etc. If you acquired or disposed of a unit performing an important amount of research and development during the 2-year period, please identify the unit in "Remarks," and give the total amount of research and development accounted for by such unit.

**Revision of Earlier Year Figures** – If your company reported for 1991, entries from that form are pre-printed on the current form. Please revise the 1991 figures to be comparable with 1992 data and explain in the "Remarks" section any significant revisions made.

**Report for Your Entire Company** – Research and development activities for your entire domestic company should be reported, including all subsidiaries, divisions, etc. Report sales and employment figures for all parts of the company, even those that do not perform R&D, as long as they are located in the 50 states or the District of Columbia.

**Period Covered by the Report** – Figures should be reported on a calendar years basis. Fiscal year data, however, are acceptable for all items except for employment, provided your fiscal year ends between September and March. Please report employment figures (items 1B and 3) for the specific time indicated for both of these items.

**Geographic Area Covered** – The data relate to business firms which operate one or more establishments in one or more of the 50 States or the District of Columbia.

Public reporting burden for this collection of information is estimated to average 5-1/2 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information including suggestions for reducing this burden to Herman G. Fleming, National Science Foundation, 1800 G Street, Washington, DC 20550; and to the Office of Information and Regulatory Affairs, Office of Management and Budget (OMB No. 3145-0027), Washington, DC 20503.

#### IMPORTANT NOTES

- **Financial information** – Report all financial information in thousands of dollars.
- **Employment information** – Report all employment information in numbers of people.
- **Sales and employment (item 1)** – Report sales and employment information from all domestic subsidiaries, including those that do not perform research and development.
- **Costs incurred for R&D (item 4)** – Include R&D depreciation and overhead in your estimated costs. Exclude R&D capital expenditures.
- **Costs incurred for R&D (item 4)** – Costs incurred for R&D performed outside the 50 States or the District of Columbia or for R&D contracted out to non-company R&D organizations should not be reported in item 4. Report R&D performed outside of the United States in item 6.

### ► Section I – General Company Data

#### Item 1 – Sales and Employment for Company

**Item 1A – Net Sales** – Report net sales and receipts for this company and its domestic subsidiaries. The reported figures should represent value f.o.b. plant after discounts and exclude freight charges and excise taxes.

*Include:*

- Sales of products and services to other companies, individuals, U.S. Government agencies, and foreign countries
- Transfers to foreign subsidiaries

*Exclude:*

- Domestic intra-company transfers
- Sales by foreign subsidiaries

**Item 1B – Employment** – Report the number of employees of the company in all activities in the 50 States and the District of Columbia during the pay periods which include March 12 of 1991 and 1992. This figure would be the same as item 1 of treasury form 941, if one form 941 was filed for the entire company.

### ► Section II – Research and Development Performed within the Company in the United States

#### Item 2 – Research and Development Expenditures

**Definition of Research and Development** – Research and development includes basic research and applied research in the sciences and in engineering, and design and development of prototype products and processes.

For the purposes of this study, research and development includes activities carried on by persons trained, either formally or by experience, in the physical sciences including related engineering, and the biological sciences including medicine, if the purpose of such activity is to do one or more of the following things:

1. Pursue a planned search for new knowledge, whether or not the search has reference to a specific application.
2. Apply existing knowledge to problems involved in the creation of a new product or process, including work required to evaluate possible uses.
3. Apply existing knowledge to problems involved in the improvement of a present product or process.

Research and development includes the activities described above whether assigned to separate R&D organizational units of the company or carried out by company laboratories and technical groups not part of an R&D organization. Reporting the R&D activities of such latter groups may require the use of estimates for some of the questions.

Activities to be excluded from R&D –

- Capital expenditures
- Routine product testing
- Research in social sciences or psychology
- Geological and geophysical exploration activities
- Technical services such as:
  - Quality and quantity control
  - Technical plant sanitation control
  - Trouble-shooting in connection with breakdowns in full-scale production
  - Advertising programs to promote or demonstrate new products or processes
  - Assistance in preparation of speeches and publications for persons not engaged in research and development

**Item 3 – Research and Development Scientists and Engineers** – Scientists and engineers are defined for this survey as all persons engaged in scientific or engineering work at a level which requires a knowledge of physical or life sciences, engineering, or mathematics equivalent to completion of a 4-year college course with a major in these fields, regardless of whether or not they actually hold a degree in this field.

The figures on R&D scientists and engineers will be obtained primarily from two sources:

1. For company laboratories performing only research and development, report the number scientists and engineers on the rolls in January.

### Item 3 – Research and Development Scientists and Engineers – Continued

2. For companies whose activities are not solely devoted to research and development, report the proportion of total work time of scientists and engineers that is devoted to research and development. For example, if a company had 60 scientists and engineers in January 1993 and one-fourth of their time was charged to R&D projects, the figure for the number of R&D scientists and engineers for this company would be 15.

### Item 4 – Costs Incurred for Research and Development Performed within the Company by Major Type and Source of Funds –

#### Include:

- Wages, salaries, and related costs
- Materials and supplies consumed
- R&D depreciation and overhead
- Cost of computer software used in R&D activities
- Total charges for work done on contract, including profit
- Utilities, such as telephone, telex, electricity, water, and gas
- Travel costs and professional dues
- Property taxes and other taxes (except income taxes) incurred on account of the R&D organization or the facilities they use
- Insurance expense
- Maintenance and repair, including maintenance of buildings and grounds
- Company overhead including: personnel, accounting, procurement and inventory, and salaries of research executives not on the payroll of the R&D organization

#### Exclude:

- R&D performed abroad (See Item 6), such as Canada and Puerto Rico
- Cost of R&D performed by non-company R&D organizations of any kind
- Capital expenditures
- Patent expense
- Income taxes and interest
- The portion of company-held R&D contracts that were subcontracted outside the reporting company
- Fellowships, grants, and gifts to promote R&D or the study of science and engineering

### Types of Research

**Item 4A – Basic Research** – Include the cost of research projects which represent original investigation for the advancement of scientific knowledge and which do not have specific immediate commercial objectives, (although they may be in the fields of present or potential interest to the reporting company).

**Item 4B1 – Applied Research** – Include the cost of research projects which represent investigation in discovery of new scientific knowledge and which have specific commercial objectives with respect to either products or processes.

**Item 4B2 – Development** – Include the cost of projects which represent technical activity concerned with non-routine problems encountered in translating research findings or other general scientific knowledge into products or process.

Exclude routine technical services to customers or other items excluded from the definitions of total research and development in Item 2.

### Type of Activity Included in Development:

- Design and operation of pilot plants and semiwork plants
- Engineering activity required to advance the design of a product or process so it meets specific functional and economic requirements
- Design, construction, and testing of prototypes and models
- Designs for special manufacturing equipment and tools
- Preparation of reports, drawings, formulas, specifications standard practice instructions, or operating manuals

### Type of Activity Excluded from Development

- Toolmaking and tool tryout
- Production of detailed construction drawings and manufacturing blueprints
- Pre-production planning

**Methods of Estimating Research and Development Expenditures by Type – (Basic, Applied, and Development)** If your company does not keep records that meet or can be allocated to these specific categories, estimate by:

1. Isolating the **projects** that clearly fall in the development category. If your company fabricates products, such development activity will include the design, construction, and testing of prototypes and models. Some defense contracts typically call for several test models. If your company's research and development frequently involves the development of a "process" as in chemicals and petroleum, such development activity would include operations beyond the bench scale, primarily the design and operations of pilot plants or semiworks.
2. Isolating the **organizational units** which have R&D activities that can be readily classified based on the function assigned to the unit. If R&D work is done in production units as well as in various laboratories, it is generally development type.
3. Distributing the **balance** on the basis of a review of individual projects or on the basis of other summaries of the work. Please use the definitions for basic, applied, and development given above.

### Source of Funds – Federal and Company

#### Item 4 – Column 2 – Federal Funds

##### Include:

- Cost of work done on Federal R&D contracts or subcontracts
- R&D portions of procurement contracts or subcontracts

##### Exclude:

- Federal R&D contracts and R&D portions of procurement contracts that you subcontracted to other R&D organizations (including these would cause duplication in the statistical totals, which include data on work actually performed by each company).

**Item 4 - Column 3 - Company and other funds, except Federal**

*Include:*

- All company-sponsored research and development performed within the company
- Performed under contract from non-federal sources

*Exclude:*

- Company sponsored research performed outside of the company

**Item 4E - Company and Other Funds, Except Federal, Budgeted for the Year 1993** - Report the estimated cost of company and other non-federally sponsored R&D that will be performed within the 50 states and the District of Columbia.

**Item 5 - Research and Development by Functional Category**

**Item 5A to 5E - Energy Research and Development** - Include all spending for research and development to increase energy resources or capabilities, including the development of energy equipment. Energy research and development can include costs of R&D projects (both product and process) on explorations, extractions, transportation, processing, storage, generation (including conversion), distribution, conservation, etc., of present, new, or improved forms of energy.

If R&D spending is for joint or multiple purposes, estimate and report the portion of cost incurred for the energy purpose. In the limited number of cases where the separation of joint (multiple) costs by type of energy cannot be estimated, include the total cost of the R&D project when the primary purpose of the project is energy research and development. If the project is not primarily for energy research and development then exclude all of the project cost.

Conservation and utilization includes R&D activities undertaken to reduce consumption either at the point of energy use or in the transmission, transportation, storage, or conversion of energy. Examples of such are research and development undertaken primarily to reduce fuel consumption in manufacturing, to improve the efficiency of transportation of energy products, or to produce an end product which is more efficient in energy consumption.

All other energy includes areas such as wind, waste, hydroelectric, etc. Also include in this category the development of energy equipment which cannot adequately be classified in items 5A to 5C.

**Item 5F - Pollution Abatement Research and Development**

- Includes R&D spending for the purpose of reducing or eliminating the emission of pollutants. "Pollution" refers to the emission of pollutants to the outside of a firm's property or activities; "abatement" includes prevention, treatment, or recycling.

*Exclude costs:*

- To contribute to environmental aesthetics
- To increase equipment durability in corrosive environments
- To conserve energy (include as energy R&D in item 5C)
- To conserve natural resource
- To increase employee comfort, safety, and health.

If the only purpose of the R&D spending is pollution abatement, include the total expenditures on the project. If pollution abatement is only one of several purposes, report only the R&D costs associated with pollution abatement. When the separation of joint costs is not feasible, include the total R&D costs for a project if the purpose is primarily (more than 50 percent) for pollution abatement.

If the project is not primarily for pollution abatement purposes, exclude all of the project costs. Also exclude project costs if expected pollution abatement benefits are obtained at no extra cost.

**Section III - Research and Development Performed Outside the Company - (R&D not included in item 4).**

**Item 6 - Total Company Funds Spent for Research and Development Activities Performed by Foreign Subsidiaries Outside the United States.**

Report the amount of research and development financed by the U.S. parent or its foreign subsidiaries and performed by company R&D laboratories, branch plants, or other organizations, located outside the United States. Include R&D funds spent in Canada and Puerto Rico. This item excludes R&D activities performed by foreign subsidiaries which were financed by foreign governments or other outside organizations.

NOTE - Foreign subsidiaries are those outside the 50 States or the District of Columbia.

**Item 7 - Status of This Company on December 31, 1992**

In the "Remarks" section, specify change or correction, e.g., "wholly-owned subsidiary of ABC Company," "merger with XYZ Company," "acquired by 123 Corporation." Provide date of organizational change.